The following eclipses of *Jupiter's* first satellite have also been observed by Captain Bayfield at the same place.

Immersions.

			Charlotte Town M.T. h m s	Longitude. h m s
1846	Oct.	8	9 7 27·20	4 12 23·10 W
		31	9 16 54·79	23·71
	Nov.	7	11 10 32·42	40·78
1847	Oct.	27	10 44 12·47	4 12 36·63
			Mean ...	4 12 31·05

Emersions.

			Charlotte Town M.T. h m s	Longitude. h m s
1843	August	27	9 47 46·11	4 12 24·19 W
1844	Jan.	14	5 50 23·13	21·67
1846	Feb.	4	10 56 36·30	27·00
1847	March	4	9 0 14·72	28·08
		20	7 20 55·52	24·08
1848	Jan.	22	6 10 38·72	4 12 23·18
			Mean	4 12 24·70 by Em.
				31·05 by Imm.
West longitude of Charlotte Town ..... =				4 12 27·88 = 63° 6′ 58″
Observatory Bastion, Quebec, West of Charlotte Town				..... 8 5 26
West longitude of Observatory Bastion, Quebec				..... = 71 12 24

"The above eclipses were observed under favourable circumstances, with the same telescope and by the same observer."

Observations to determine the Latitude of Dera and the disturbing force of the Himalayas. By Captain Shortrede.

The latitude observations were made at Dera in 1841 with a 12-inch vertical circle of an altitude and azimuth circle, by Troughton and Simms, read by microscopes, and having a telescope 20 inches' focus, with 1·8 inch aperture.

Several altitudes of the stars were observed on each face, and near the meridian, to which they were reduced. The error and rate of the chronometer were found by transits of stars on opposite sides of the zenith.

The accordance of the observations, which are sufficiently numerous, is very satisfactory. The mean of the northern stars gives the latitude 30° 19′ 19″·93 N. of the southern stars 23″·81,

and the mean of both 21″·87. By combining, in pairs, the north and south stars which have nearly the same zenith distance, Capt. Shortrede finds the latitude 30° 19′ 22″·8 N., which result he conceives cannot well be 1″ from the truth.

The place of Captain Shortrede's observations is about 100 feet due west from the chimney of the Surveyor-general's office at Dera. This chimney is fixed by triangulation from the great Indian arc, in the series which passes northward from Kalianpur through Kaliana to Banog. From Banog to the snowy peaks of the Himalayas is about 50 miles.

The latitude of Kalianpur	=	24 07 11·84 N. by observation.
,, Kaliana	=	29 30 48·90 N. ,,
Difference	=	5 23 37·06
But this difference is by triangulation	=	5 23 43·49
Or the two results disagree by		6·43 in 323′·6

This arc adjusted by Colonel Everest, in calculating his latitudes from survey, by shortening the distances about 2 feet on 1′ of latitude (see his measure of the Indian arc, p. clxx), and he uses the same allowance in calculating the latitude of Banog from the triangulation.

Captain Shortrede proceeds thus to establish the amount of local disturbance in the latitude of Dera,—

Banog is	0 57 42·18	north of Kaliana, by *survey*.
Dera is	0 8 37·53	south of Banog, ,,
Or Dera is	0 49 4·65	north of Kaliana, by *survey*.
Latitude of Kaliana	29 30 48·89	by *observation*.
Latitude of Dera =	30 19 53·54	derived from Kaliana and survey.
=	22·78	by Capt. S.'s observations.
Difference	30·76	

Which seems to arise from the difference of the attraction of the Himalayas at Kaliana and Dera.

By comparing the differences between the azimuths, as observed and calculated from Kaliana to Banog, Capt. S. finds the deflection in azimuth at Banog to be about 15″·16, but not very certain, *i.e.* it may be in error ±1″.

Captain Shortrede now assumes that the disturbing effect of the Himalayas may be compared to that of a fixed centre of attraction, and proceeds to find the direction and distance of a centre of attraction which would alter the latitude and azimuths in the same way, and to the same amount, that they are found to be altered. He finds a fixed position for a centre of attraction on the above hypothesis, which will change the latitude 30″·76 between Kaliana and Dera, and also change the azimuth 15″·16 between Kaliana and Banog.

"The assumption of a fixed centre of attraction is not faultless, but as matters stand it may serve as an approximation not likely to be greatly erroneous, for on any of the above suppositions the extreme difference in the values of its direction is under 8°, and

for so small a variation in aspect, the error in the assumed fixity is not likely to be great."

To find the Error and Rate of a Chronometer from the observed Transits of Three Stars near the Meridian. By Capt. Shortrede.

This is not a problem of frequent occurrence, but it did present itself to Capt. Shortrede on the first day of his observations at Dera.

His solution is to the following effect: — The transit is supposed to be adjusted for level and collimation, or, which is the same thing, the observations are corrected for these errors. Each observation, when compared with the apparent R.A. of the star, furnishes an equation with three unknown quantities, viz. the *clock error* at the first observation, the *azimuthal error* with a known coefficient (the latitude being known approximately), and the *rate*, which has for a co-efficient the time from the first observation. From these equations the azimuthal error and clock error may easily be deduced if the stars be properly selected; and the rate will be found, unless the stars observed are too near the pole, or follow each other too closely. It would generally be more advisable to get the *rate* from one or more pairs of known stars near the equinoctial, the first of each pair being observed at the beginning and the last at the end of the night's work.

Captain Shortrede wishes it to be remarked "that the limitation in M.N. p. 160, with respect to the polar distance of the star, is unnecessary when the elongations are observed on both sides of the meridian. Errors in the assumed latitude or polar distance of the star will, in this case, correct each other."

Extract of a Letter from Dr. Lee to the Secretary.

"I take leave to offer to the Society for its acceptance an original painting of Mr. Joseph Middleton, who founded, in 1717, the respectable and useful Society of Mathematicians in Spitalfields; the worthy surviving members of which, by the recent act of union, are now Fellows of the Royal Astronomical Society.

"Little is known concerning the life and adventures of this worthy man. It is conjectured that he was the mate or captain of a vessel in the merchant service, and that in the later portion of his life he gave instructions in mathematics, and particularly in those branches which relate to navigation, in the neighbourhood of Spitalfields.

"In the Library of the late Mathematical Society is a manuscript in folio, relating to arithmetic, algebra, and navigation, which is supposed to have belonged to and to have been composed